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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/880,859	06/15/2001	Martin E. Lee	102305.05	7353

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EXAMINER
RO, BENTSU

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 06/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/880,859	LEE, MARTIN E.	
	Examiner	Art Unit	
	Bentsu Ro	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *4/29/02* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *34-157* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34-157* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

FINAL REJECTION

1. A substitute specification is required. The specification as originally filed is so unclear that some of the sentences are not legible due to a repeated copying.

In response to the Examiner's First Office Action, applicant has amended the independent claims 34, 72, 104 and 133 by adding the limitation "in a two-dimensional plane". This limitation has overcome the teaching of US Patent No. 4,383,757 to Phillips, but does not overcome the teaching of US Patent No. 4,654,571 to Hinds. Therefore, the following explanation of rejection is based on the Hinds teaching.

2. First group claims 34-57, 59-63, 65-67, 69-71; second group claims 72-97, 99-100, 102-103; third group claims 104-107, 109-110, 112, 114-124, 126-127, 129-132; and fourth group claims 133-136, 138-140, 142, 144-154, 156-157 are all rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hinds US Patent No. 4,654,571.

The following chart compares applicant's amended claim 34 (the most comprehensive claim) with Hinds teaching.

The Amended Claim 34:	**Hinds teaching:**
A method of making a microlithography system that forms an image onto an object, comprising the steps of:	Fig. 1 shows a complete system and a method for making a microlithograph onto an object; the object reads onto the wafer 14;
providing an irradiation apparatus that irradiates the object with radiation to form the image on the object;	Fig. 1 shows a photo head 16; the photo head 16 irradiates image onto the wafer 14, see text column 1, line 16, for example;
providing a movable stage associated with the irradiation apparatus;	the platform 10 is a movable stage; alternatively, the device that holds the wafer 14 could be read as a movable stage;
providing a first support structure;	the table surface 20;
providing a second support structure dynamically isolated from the first support structure;	the platform 10 is a second support structure;

	it is noted that the platform 10 is dynamically isolated from the table surface 20 by air bearing 12, namely, there is no mechanical contact between the platform 10 and the table surface 20;
providing a drive to move the movable stage in a two-dimensional plane	Fig. 2 shows coils 64-67 for moving the platform 10 in a two-dimensional plane over the table surface 20; thus, the coils 64-67 are "a drive";
such that a reaction force exerted by the movement of the movable stage is transferred to the first support structure; and	in order for the platform 10 to move, the coils 64-67 in the platform 10 must exert a force toward the magnetic elements 22 on the table surface 20; the magnetic elements 22 absorb the reaction force exerted by the coils 64-67 and push the coils forward to move the platform 10; therefore, the reaction force is absorbed by the table 20;
providing a position detector to detect a position of the movable stage in the two-dimensional plane,	Fig. 1 shows laser interferometers 32, 33, 34 and reflectors 40, 41, 42; it is very important to note that an interferometer consists of two components: the laser source and the reflector; the laser source is fixed while the reflector moves so that the interferogram can be obtained; the interferometers 32, 33, 34 shown in Hinds Fig. 1 are actually laser sources, not complete interferometers; a complete interferometer must include the laser source and the reflector; the laser sources and the reflectors cooperate together to detect a position of the platform 10 in the two-dimensional plane;

the position detector being supported by the second support structure.

the reflectors 40-42 are supported by the platform 10, which is a second support structure.

One very important note from the examiner is that Hinds arrangement of the interferometer is same as that of applicant's. Applicant's Fig. 1C shows an interferometer system 92 (the laser source) mounted on block 22,26,27 while the mirror 38X (the reflector) mounted on the xy-stage 30 (the movable stage). In this embodiment, applicant claims the mirror mounted on the movable stage as a position detector, rather than the laser source mounted on the fixed block structure as a position detector. Hinds also teaches a reflector mounted on the movable stage. By the same token, Hinds reflector is a position detector. (The saucer for the goose is the saucer for the gander.)

Regarding claims 35, 40, 41, the photo head 16 is supported by the table structure 20. It is noted that the photo head 16 cannot be supported by the platform 10 because the platform 10 must move relatively to the table 20 for receiving image from the photo head 16, therefore, the photo head 16 must be fixed to the table 20.

Regarding claims 36 and 37, the photo head 16 is an optical projection system.

Regarding claim 38, the platform 10 is located below the photo head 16.

Regarding claim 39, Hinds Fig. 1 shows a photomask 17.

Regarding claim 42, the first mirror reads onto the reflectors 40-42, the second mirror reads onto the mirror 46.

Regarding claims 43, 46, 65, 69, the magnetic elements 22 are fixed to the table 20, the coils 64-67 and the air bearings 12 move freely over the table 20 without any guidance system.

Regarding claims 44, 51, 66, 70, the wafer 14 is a substrate.

Regarding claim 45, the movable stage and the second support structure together read onto the platform 10.

Claim 47 reads onto Hinds teaching as follows: A method according to claim 46, wherein the second support structure (the platform 10) includes a base member (the air bearings 12, see Fig. 2), the guideless stage is movable over a surface (the surface of the air bearings 12) of the base member on a bearing (the air bearings 12 push the platform 10 upward by flowing air so that the platform 10 can be moved freely by the force of the magnets/coils interaction.)

Regarding claims 48, 49, 53, 54, the air bearings 12 is a non-contact supporting device.

Regarding claims 50 and 55, the magnets 22 and the coils 64-67 provide non-contact bearing.

Claim 52 reads similarly as that of claim 47 show above.

Regarding claims 56, 57, 59, all equipments must be supported by a foundation, including the Hinds system.

Regarding claims 60, 61, 62, the coils 64-67 and the magnets 22 together constitute a linear motor.

Regarding claim 63, Hinds system includes the rotation of the platform 10, see column 1, last line; column 3, line 38; column 5, last line, the angle θ; etc.

Regarding claim 67, Hinds Fig. 1 shows X and Y servo circuits 58. Column 5, last line describes the X, Y positioning.

Regarding claim 71, the table 20 supports the magnets 22. It is noted that magnets 22 is a part of the drive, in that, the magnets 22 cooperate with the coils to move the platform 10.

The above rejections explain the first group claims. The second, third, and fourth group claims read similar to that of the first group claims. Further explanation is not necessary and is therefore omitted.

3. Claims 58, 98, 108 and 137 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinds as applied to first through fourth group claims above, and further in view of Kembo et al US Patent No. 4,803,712.

Regarding these claims, Kembo et al Fig. 3 shows a vibration isolator 11, positioned between the floor 1 and the system above the vibration isolator. In view of the Kembo et al

teaching, it would have been obvious to a skilled person in the art to add such a vibration isolator to Hinds system if the floor of the Hinds system is indeed required such a vibration isolator.

4. First group claims 34, 63, 64, 67, 68; second group claims 72 and 101; third group claims 104, 110-114, 125, 127, 128; and fourth group claims 133, 139-145, 155 are all rejected under 35 U.S.C. 103(a) as being unpatentable over Slater et al US Patent No. 4,980,718.

Or, alternatively, these claims are rejected under 35 USC 103(a) as being unpatentable over Slater et al in view of the general arrangement of elements and the structure of Hinds 4,654,571 patent cited in paragraph 2 above.

Regarding claims 34, 63, 67, 72, 104, 110, 112, 114, 127, 133, 139, 140, 142, 144, 145, Slater's Fig. 5 shows a similar arrangement of microlithography system, including wafer stage 25, reticle plate 5, optical system 20, etc. Fig. 8 shows a carriage 59, a base table 62, etc.

Most importantly, Slater Fig. 8 shows gas bearings 60 and 65 for isolating the carriage 59 from the table 62. Fig. 8 further shows a linear motor (or stepping motor) 68 fro moving the carriage 59. It is important to note that the linear motor must have coils and magnets, one of the coils and magnets is located on the table 62 and the other of the coils and magnets is located on the carriage 59. The coils and the magnets are in a non-contact arrangement, and also no guidance between them. The same structure is also shown in Hinds teaching as explained in paragraph 2 above.

Regarding claims 64, 68, 101, 111, 113, 125, 128, 141, 143, 155, Slater's column 9, lines 49-50 clearly shows the yaw error correction.

5. Applicant's remarks have been fully considered. With respect to Phillips teaching, applicant's amendment has overcome this reference. However, with respect to Hinds and Slater teachings, applicant's only argument is that the Hinds position detector is supported by the first support structure, not by the second support structure, whereas the claims recite that the position detector is supported by the second support structure.

In the previous paragraph 2, the examiner has clearly explained the components of an interferometer in that, the laser source is supported in a fixed structure whereas the reflector is supported in a movable structure.

In applicant's embodiment, applicant claims the mirror mounted on the movable stage as a position detector. Thus, Hinds reflectors mounted on the movable stage is also a position detector. The reflector is mounted on a second support structure as claimed. (The saucer for the goose is the saucer for the gander.)

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CAR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CAR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication should be directed to Bentsu Ro at telephone number 703 308-3656.

June 6, 2002

Bentsu Ro
BENTSU RO
PRIMARY EXAMINER